



Data Sheet

4916
Antenna
Coupler



Boosting wireless efficiency

All mobiles fit on 4916 Antenna Coupler

Willtek's 4916 Antenna Coupler moves mobile phone testing into a new dimension by solving three challenges:

- Testing mobile phones with a good RF connection independent of size and antenna location,
- A wide frequency range covering current and upcoming 2G and 3G frequency bands,
- An RF match, as yet unachieved in the market, for measuring accuracy and with high certainty.

The 4916 Antenna Coupler achieves all three objectives without compromising on state-of-the-art performance. It ensures an enhanced level in mobile phone testing to service shops, repair centres, manufactures and R&D labs.

The diversity in mobile phone design is ever increasing. The age of the simple rectangular phone with a top-located antenna has passed. Today's phones are made in all kinds of shapes and sizes with varying antenna positions.

A testing device such as the 4916 Antenna Coupler needs to reflect this. Its flexible shuttle allows every phone antenna to be moved above the „sweet spot“ (centre point of reception) to provide precise and repeatable measurements.

The standard shuttle carries a universal mobile phone cradle suitable for most standard phones. Phones can be placed on or removed from the 4916 Antenna Coupler using only one hand. The shuttle snaps in five locations, guaranteeing sustained accuracy of measured results.

To test large phones like PDAs, the standard shuttle can be replaced by a shuttle with a PDA cradle.

The XY Shuttle can be moved in two dimensions, reducing the coupling loss and increasing measurement repeatability.

Data cards for notebook PCs can be tested with the 4916 and the 1210 PCMCIA Data Card Testing Option (see separate data sheet).

Move the shuttle down while pressing the unlock latch, remove the shuttle from the 4916's coupling plate, place the PDA or the XY shuttle on the plate and move it up. That's it! 4916's PDA shuttle carries a universal cradle for all types of wide phones and wireless PDAs. On the XY Shuttle, two flexible clamps hold the device in the desired position.

Highlights

- 3G ready solution for all mobile phone types
- Wide frequency range for future technologies
- Precise results with excellent RF match
- Good coupling values on all phones
- High repeatability using snap positions



On the XY Shuttle, the mobile phone can be fixed in 25 positions from the top-right to the bottom-left corner

Wide frequency band covers 3G, Wireless LAN and GPS

Willtek's 4916 Antenna Coupler covers a continuous wide frequency range from 700 MHz to 2.7 GHz. Unique to the market, the 4916 covers all frequencies within this range without gaps in between. This wide range encompasses all current mobile phone frequency bands such as GSM 850/900/1800/1900, CDMA, TDMA, AMPS, UMTS, CDMA2000, TD-SCDMA, Bluetooth™, Wireless LAN, GPS and future technologies, extended cellular (750 MHz) and Galileo.

All these systems are encompassed by a new antenna design. This also means a centre point for all frequencies, no compromise in coupling position on dual or triple-band phones.

Additionally, this antenna design is non-sensitive in orientation. Horizontal or vertical polarisation makes no difference. Good coupling values are achieved for both polarisations. Especially in respect of new mobile phones with built-in flat antennas (PIFA) have different polarisations through the frequency bands. The RF design of the 4916 tolerates different polarisations and provides continuously good coupling values. The results can be repeated, regardless of whether the antenna is a stick-on, left, right, centre or a flat built-in antenna.



Precise measurements with high accuracy

A measurement tool needs to support precise testing. Therefore special wideband RF networks are designed to provide an excellent match – an RF match which is unique in the antenna coupler market. With this RF match, precise measurements are possible without compromising accuracy.

Conversely, a bad RF match can also impact the frequency response. This will result in incorrect RF level measurements or in distortion on wideband carriers like Wideband CDMA, CDMA2000 or Wireless LAN. The 4916's frequency response is flat, ensuring very little coupling variation within a band and no impact on wideband carriers.

Moving mobile phones closer to the coupling antenna may increase resistance to interfering signals. Such interfering signals may come from base stations, or from mobiles being tested on an adjacent workbench. Interference can also occur if the test signal is reflected by a metal plate close to an antenna coupler. Measurements achieved with high coupling losses can easily be impacted by other signals or reflected waves. Such measurements produce a false reading. With good coupling values – like those on the 4916 – the interference impact is low and mostly below measurement resolution.

Standard shuttle for Go/NoGo tests

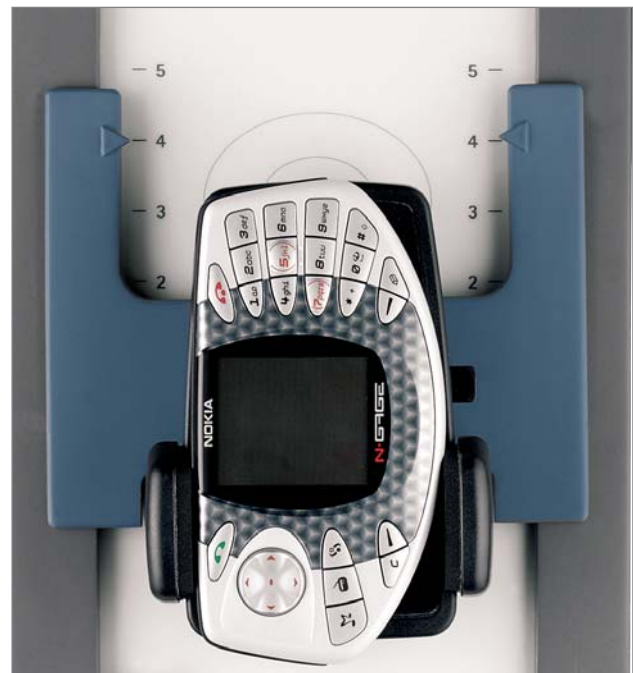
The mobile being tested must be positioned correctly over the coupler to ensure accurate readings. The 4916 with the standard shuttle has five snap-in positions, which are spaced 2 cm or 0.8 inch apart. This is close enough to find a suitable position for good coupling values, but also wide enough to avoid handling errors.

XY Shuttle for high-precision measurements

The XY Shuttle brings the mobile phone even closer to the coupling antenna, further improving measurement accuracy and repeatability. The position of the mobile phone over the coupler can be adjusted in two dimensions (vertical and horizontal). Five snap-in positions in each dimension guarantee reproducible results if the same position is used for a type of mobile phone.

The measurement accuracy is improved by reducing the cou-

pling loss between the phone and the coupler antenna: With the XY Shuttle, the receiver of most test instruments will operate in the optimum level range to allow high-precision measurements.

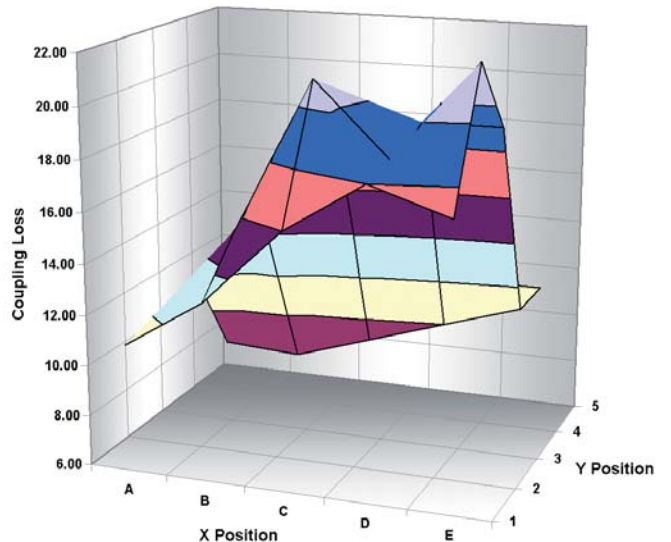
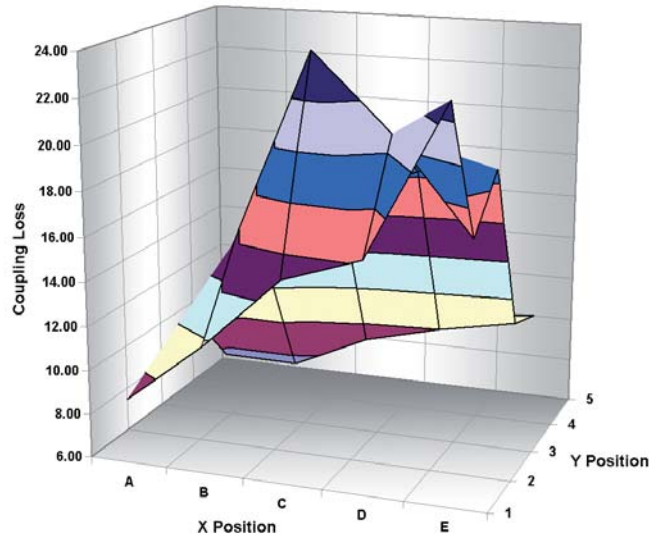


Willtek's support beyond the product

Testing the mobile phone through a RF coupling device has the advantage of including the antenna in the test. However, any antenna coupler also picks up other signals from the air, which may impact the results. Therefore, Willtek is also offering a small shielding chamber that avoids interference between the phone under test and real network components. This shielding chamber, the 4921 RF Shield, fulfils the shielding requirements of more than 70 dB.

RF coupling means that the signal is radiated over the air rather than a cable. Part of the signal sent by one device is received by the other; the rest of the signal is lost in the air. For power level and receiver measurements it is essential to compensate this coupling loss. The test instruments from Willtek can be set up so that they compensate the coupling loss and deliver precise measurements if the correct coupling factors are entered.

If you are using the 7310 Lector and Scriptor family for test automation products, the software can automatically set up the correct coupling factors for use with the 4916 Antenna Coupler and the 4921 RF Shield. The optional 7360 Coupling Factor Update License includes the coupling values for more than 450 wireless devices for different wireless standards and is continuously updated for new phones. For each frequency band supported by the phone, there are one or more coupling factors for each the receive and transmit frequency band.



For the 7360 Coupling Factor Update License, Willtek determines the optimum coupling position after evaluating the coupling in all 25 positions on the fixture, in both directions (transmit and receive) and in all the frequency bands supported by the mobile phone

Shielding avoids false results and protects against interference

Testing mobile phones on an antenna coupler requires operation of the mobile phone on various frequencies at different power levels.

These frequencies are often used by network operators. Interference is an obvious problem. Even though interference of surrounding signals is reduced by 4916's good coupling values, they are still present.

Additional mobile phones under test radiate, and this radiation has a high potential of interfering with a mobile phone network.

These interference effects range from bad voice quality to disrupting mobile phone calls in the vicinity.

The Willtek 4921 RF Shield encloses the 4916 Antenna Coupler, providing the necessary isolation. The package consisting of RF Shield and Antenna Coupler ensures accurate, interference-free testing and avoids distortion of network operators' business.



1210 enables 3.5G data card tests

The third generation of wireless devices brings about PCMCIA cards for data communications. The current communication testers address the need for testing these devices on GPRS, EDGE, WCDMA, HSPA, CDMA2000 and 1xEV-DO data channels as well as for WLAN enabled data cards. The 4916 Antenna Coupler with the 1210 PCMCIA Data Card Testing Option now closes the gap between the wireless device and the test instrument!

Data cards with either 16-bit or 32-bit interface can easily be tested with the 4921 RF Shield PCMCIA Package, a test instrument such as the 4400 Series Mobile Phone Tester or the 3100 Mobile Fault Finder, and a PC. The package includes the 4921 RF Shield, the 4916 Antenna Coupler, the 1210 PCMCIA Data Card Testing Option and two adapters for PCMCIA cards. Software drivers for products from data card manufacturers like Novatel Wireless, Sierra Wireless and Option are also included and can be updated from the web; a complete list of data cards supported can be found at www.elandigitalsystems.com/support/uFAQ/supportedcards.php (see U111 and U142-supported 3G data cards).



Specifications

Frequency range (continuous)	
Usable	700 to 2700 MHz
Optimised	800 to 2200 MHz
RF match (VSWR)	
in the range 0.8 to 2.2 GHz	< 2.5, typ. 2.0
Coupling deviation	
to reference unit	< 0.7 dB
between two units	< 1.4 dB
Max. power	
at the mobile phone	38 dBm
At 4916's QMA connector	26 dBm
RF connector	
On board	QMA (Quick SMA)
RF cable	N-Type or TNC
Weight	
Board	approx. 700 g
Shuttle	approx. 130 g
Dimensions	
Board	175 x 255 x 50 mm
Standard shuttle	160 x 120 x 55 mm
XY Shuttle	218 x 125 x 33 mm
PDA Shuttle	160 x 120 x 65 mm

Ordering details

4916 Antenna Coupler	M 248 641
Coupling plate and standard shuttle	
4921 RF Shield (N) &	M 248 348
4916 Antenna Coupler package includes RF cable N (fem.) – N (fem.)	
4916 Antenna Coupler with XY Shuttle	M 248 720
4916 Antenna Coupler and 4921 RF Shield package (N-N) (with XY Shuttle)	
XY Shuttle for 4916 (upgrade)	M 248 698
PDA Shuttle for 4916	M 248 692
Shuttle with universal cradle for PDA or wide phones	
1210 PCMCIA Data Card Testing Option	M 248 509
Upgrade for existing couplers, includes shuttle for 4916, modified back panel for 4921, power supply, cables, software	
1210 32-bit PCMCIA Adapter	M 375 444
1210 16-bit PCMCIA Adapter	M 375 445
4921 RF Shield PCMCIA Package	M 248 463
4921 RF Shield, 4916 Antenna Coupler, 1210 PCMCIA Data Card Testing Option, 32-bit and 16-bit PCMCIA adapters	



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